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Notes on the Zoology of Newfoundland.

By HENRY REEKS, Esq., F.L.S., &c.

Letter 1.—ORNITHOLOGY.

BEFORE commencing a systematic list of the avi-fauna of Newfoundland, it will perhaps be necessary to say a few words on the island itself. Newfoundland, as my readers are probably aware, forms one of the valuable British colonial possessions on the coast of North America. Its geographical position lies between lat. 46° 37′ and 51° 40′ north, and long. 52° 41′ and 59° 31′ west: it is bounded on the north by the Straits of Labrador, on the west by the Gulf of St. Lawrence, and on the south and east by the Atlantic Ocean, and has a seaboard of nearly two thousand miles. There is a chain of mountains, or rather in many places high table-land, running almost throughout the island in a N.E. and S.W. direction. The low land is made up of vast savannas, intersected by extensive woods, lakes and rivers—one inland lake alone being sixty-five miles long, and containing an island as large as the Isle of Wight, and which seems to have been the last stronghold of the Red Indians. Since the extermination of this persecuted race (which probably took place not more than thirty years ago) the whole of the interior of the country has been uninhabited. Several "histories" of Newfoundland have appeared from time to time, and among the best of these I may mention one by Chief Justice Reeves, published in 1793, another by Anspach in 1820, and the last by the Rev. C. Pedley in 1863; but, strange as it may appear, none of these authors give any reliable information on the natural history of this extensive island; which, besides being rich in its fauna and flora, will, I have no doubt, prove equally so in minerals. In some places I have also seen as good a surface-show of petroleum oil as in the well-known oil-regions of Pennsylvania. A two years' residence, under the most favourable circumstances, in a country nearly as large as England, and where the forests are still primitive and in many places almost interminable, is scarcely sufficient time to warrant anything like a correct list of the animals or plants; but when impeded by such a severe accident as I sustained from frost, and which kept me a prisoner to the house for several months, no other apology is necessary for the incompleteness of these "Notes," which none can possibly regret more than the writer. There are few

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inhabited countries, perhaps, on the face of the globe, where the naturalist gets less assistance in the oological department than in Newfoundland. The whole and sole occupation of the settlers on the north-west coast is fishing and furring,—the former in summer and the latter in winter,—and upon their success entirely depends the stock of provisions they will be enabled to obtain, by barter with the traders, for the long period of nine months, when no vessels visit the unsafe harbour of Cow Head. Of course the postal arrangements there are not exactly A 1—never exceeding *one* delivery a day, and this at intervals of from one month to six weeks in June, July, and August, and usually *not at all* between the first of September and 1st of the following June. During the nesting season the assistance of a man worth anything could scarcely be obtained under a sovereign a day, and then, for want of knowledge of those birds not used as food, he may bring you a lot of eggs unknown and unidentified, and consequently worthless. My plan was probably better: I offered a fair reward for all eggs with which I was tolerably familiar; and although I got but few, I ran a far less risk of paying for worthless articles. Although I am answerable for all statements in these "Notes," except when otherwise expressly stated, my friend Prof. Newton—than whom no one is more competent—has kindly undertaken to look through the list previously to publication, for the purpose of calling my attention to any passages which may require further verification or particularizing, and thereby enhance their value. I have much pleasure in addressing these "Notes" to Mr. Spencer F. Baird, of the Smithsonian Institution, and Mr. G. N. Lawrence, of New York, in remembrance of their kindness to me during my stay in the United States. The classification and nomenclature of the authors of "Birds of North America" has been adopted in the following list.

FALCONIDÆ.

Pigeon Hawk (Falco columbarius, *Linn.*)—This beautiful little hawk, so closely resembling the merlin (*F. Æsalon*), is a summer migrant to Newfoundland, and is tolerably common: its food consists chiefly of small birds, especially some of the smaller species of Tringæ, which abound on the coast in the fall of the year. Since my return I have compared specimens of this species with others of F. Æsalon, and, although I cannot find any material or reliable difference in *size*, the species are easily separated by examining the tails. Both sexes in F. columbarius have *four distinct* black bars—

three exposed, and one concealed by the upper tail-coverts. In F. Æsalon the female *only* has the tail-bars distinct, and they are *six* in number—five exposed and one concealed. The bars on the tail of the adult male F. Æsalon, although *six* in number, are only partially defined, and consequently very indistinct. The bill of F. Æsalon is slightly more compressed laterally, but not so much so horizontally as that of F. columbarius. The tibiæ in my adult male specimens of the American bird (F. columbarius) are darker ferruginous, with narrower longitudinal lines, than in my English specimens of F. Æsalon; but this distinction may not be constant. I had almost forgotten to state that the inner webs of the tail-feathers of F. columbarius are white, except where crossed by the black bars—in this respect differing from F. Æsalon, which has scarcely any variation in either web, both being bluish ash.

Greenland Falcon (F. candicans, *Gmelin*).—This is the "white hawk," of the Newfoundland settlers. It is pretty regular in its periodical migrations, especially in the fall of the year. I was not successful in obtaining specimens; I do not think it breeds in any part of Newfoundland.

American Sparrow Hawk (F. sparverius, *Linn.*)—A summer migrant to Newfoundland, but not so common as F. columbarius.

The following species of Falco may reasonably be expected to occur (and probably do so) in Newfoundland occasionally:—The duck hawk (*F. Anatum*) and the Iceland falcon (*F. islandicus*).

American Goshawk (Astur atricapillus, *Wilson*).—I have only the authority of the settlers for including the "goshawk" in my list of Newfoundland birds. I have no reason to doubt their accuracy, as the more enlightened on Ornithology recognised the plate of this species in Faun. Bor. Am., where the scientific name only is given.

Cooper's Hawk (Accipiter Cooperi, *Bonap.*)—A summer migrant; not uncommon.

Sharpshinned Hawk (A. fuscus, *Gmelin*).—A summer migrant, and about equally common with the preceding. I have not seen the young of this species, but the adult very closely resembles our sparrow hawk (H. Nisus) both in flight and plumage. I have not, however, compared specimens, but hope to do so before the conclusion of these "Notes," and give the result.

Redtailed Hawk (Buteo borealis, *Gmelin*).—A summer migrant, but not so common as on the mainland. I only examined one specimen, shot in Newfoundland.

The following species of Buteo probably occur on the island:— The redshouldered hawk (*B. lineatus*, Gmel.) and the broadwinged hawk (*B. pennsylvanicus*, Wilson). I think I have seen the latter on wing, but obtained no specimen.

Black Hawk (Archibuteo Sancti-Johannis, *Gmelin*).—Common; more especially in the immature plumage, in which state some specimens so closely resemble A. lagopus that it is hard to distinguish between the species. I had an individual of the former species —A. Sancti-Johannis—which agreed so well with descriptions of A. lagopus that I named it as such in my note-book. I kept this specimen alive for upwards of two months, and fed it almost entirely on trout (*Salmo fontinalis*), to which it seemed particularly partial, but invariably refused smelts (*Osmerus viridescens*), either dead or alive, and fresh from the water. I never tried any other specimens of fish, and cannot account for the bird's dislike to the smelt; it may have been the peculiar cucumber-smell—certainly not the taste—which this delicious little fish possesses. I do not think A. Sancti-Johannis a "fisher" by nature; at least, I never saw it in the act of fishing. Unfortunately I did not preserve the skin of this bird (the feathers got rather shabby during confinement); had I done so, I think it would have puzzled more than one good ornithologist to separate it from skins of the European A. lagopus, inasmuch as the under surface of the body was no darker than ordinary specimens of A. lagopus, although I never examined any afterwards but what were, as a rule, much darker. My bird was a female and measured twenty-three inches, wing sixteen and three-quarter inches, and, from the appearance of the ovary, would have laid the following year (1867). The black hawk—or, rather it should be buzzard—is a summer migrant to Newfoundland, but, as a rule, remains later in the fall than most of the Falconidæ.

American Hen Harrier (Circus hudsonius, *Linn.*)—Although one of the most abundant hawks in the Atlantic States of America, and said by my old friend Downs to be equally common in Nova Scotia, I did not, strange to say, obtain a single example in Newfoundland, although I found some of the settlers knew the bird by its white rump, and distinguished it by the name of "hen hawk." I am almost certain of having seen it on wing myself at Cow Head. Without specimens, it is impossible for me to say in what peculiarities of plumage (if any), &c., this bird differs from the European C. cyaneus.

Bald or Whiteheaded Eagle (Haliæëtus leucocephalus, *Linn.*)—This handsome bird is called the "grepe" in Newfoundland. It is tolerably common, but as the settlers increase, this noble bird gradually, but surely, decreases. Twenty years ago, or even less, several eyries existed in the immediate neighbourhood of Cow Head, but at present the sites only remain; it is said to breed on a peculiar island-rock, called "The Prior," in the mouth of the Bay of Islands. I have, on more than one occasion, seen the "grepe" fishing at Cow Head and Bonne Bay, and obtained one egg from the latter place. The nest was built in a large pine-tree, and contained two eggs—one addled: the egg is very similar to that of H. albicilla.* The bird is only a summer migrant to Newfoundland.

It is not improbable that Aquila canadensis may eventually be found to visit Newfoundland.

American Osprey, or Fish Hawk (Pandion carolinensis, *Gmel.*)—This fine species is common in Newfoundland: it is a summer migrant, coming in May and retiring in the early part of October. Often, on a calm summer's evening, as I lay on the grass smoking my pipe, have I watched two or three pairs of these birds fishing in the harbour. Suddenly the slow circling flight is stopped,—the quick eye discerns its scaly prey,—the body assumes an almost vertical position; the wings for a moment vibrate rapidly, as if to give their owner impetus, and then with almost unerring aim, like an arrow from a bow, the osprey drops into the water. In a few seconds he reappears, and rising a few feet from the water, the rapid vibration of wings is again observable, but this time only to drive the claws more firmly into the sides of his finny morsel, with which he slowly sails away to some high tree in the woods, where probably is a nest,—

> "Itself a burden for the tallest tree."

This beautiful hawk does not escape the ruthless "gunners" in Newfoundland, although utterly useless after death to the settlers. The osprey builds in trees in the extensive woods, either near the sea-coast or some inland lake. The eggs which I obtained from Bonne Bay cannot be distinguished from European specimens received from the late Mr. Wheelwright. Having no English specimens of the osprey by me, I am unable to point out any differences whereby they may be selected from American examples. The authors of 'Birds of North America' give none; both Wilson and Audubon considered the European and American osprey of the same species.

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* In the Proc. Zool. Soc. for 1863 (p. 252) Dr. Sclater recorded H. albicilla as a Newfoundland bird, an error which he corrected in the 'Proceedings' of the same Society for 1865 (p. 701).

STRIGIDÆ.

American Barn Owl (Strix Pratincola, *Bonap.*)—Apparently rare in Newfoundland: I only examined one specimen during my residence there, which, having only the first joint of the wing broken, was kept alive several days by the children of the man who shot it: this occurred in August, 1866. It is probably a summer migrant.

Great Horned Owl, (Bubo virginianus, *Gmel.*)—Visits Newfoundland for the purpose of nidification, and is not very uncommon during that season, and more especially later in the summer when the young leave the nests. It is called the "cat owl" by the settlers. The only nest which came under my observation was built *on the ground*, on a tussock of grass in the centre of a pond. The same nest had been previously occupied for several years by a pair of geese (*Bernicla canadensis*). I think it the more important to note this observation (which, however, may not be constant even in Newfoundland, as birds of prey are very varying in this respect) as Mr. E. A. Samuels, in the 'Birds of Massachusetts,' says it "nests in hollows of trees, and in high forks of pines."

HENRY REEKS.

(To be continued.)

Life-Histories of Sawflies. Translated from the Dutch of M. S. C. SNELLEN VAN VOLLENHOVEN, by J. W. MAY, Esq.

(Continued from Zool. S. S. 1471).

NEMATUS AURANTIACUS, *Hartig.*

For the imago see *Hartig, Blatt-und Holzwespen,* p. 197, No. 25.
Larva undescribed.

Nematus niger, antennis subtus, ore, prothorace, pleuris, pedibus et alarum stigmate flavis aut luteis, abdomine aurantiaco.

In the beginning of June, 1846, I met with a whole family of the larvæ of this insect, feeding on poplar in one of the lanes near the village of Warmond; I took them home, where I fed them, and, after having made drawings of them, I had the good fortune to succeed in rearing the perfect insect.

The larvæ in question were one centimetre long, the head was shining black, the jaws dark brown, the six thoracic legs were black at the bases—and further, as far as the claws, purplish brown. The first three segments of the body were deep- or orange- yellow, the fourth greenish yellow, the six following clear green, the last two again were deep yellow; the twelve abdominal legs were green, the two anal legs yellow. On the first segment were six small shining black spots, on the three following nine longitudinal rows of two spots each, of which those above the legs were confluent—or, on each segment, two transverse rows of nine spots. Above the legs, on either side of the following six abdominal rings, were two elliptical spots placed diagonally one above the other; above these were three smaller vertical elliptical spots, succeeded by two larger round black ones. On the last two segments were seven or eight dots on either side, nearly every one having a short black hair; there were no spines on the last segment; between the legs on the ventral surface, which was green, were six green-coloured glands.

These larvæ, after feeding on the leaves, spun up among them and the mould on the 6th, 8th, 9th and 10th of July. The cocoons (fig. 6) were gray or brownish yellow, with a coarse and veined exterior of a brown colour; they were 9 mm. long. In the warmest part of the summer this insect appears to require not more than seven days for the passage from larva to imago, as on the 14th I found an imago (a female) had made its appearance. On the same day I also found among the cocoons a pupa, the larva of which had apparently omitted to spin a cocoon. This pupa, represented at fig. 5, was glassy; thorax and anus yellow; dorsum greenish; the legs, palpi and antennæ white; the eyes black.

I frequently afterwards met with these larvæ, and, if I am not mistaken, I observed three generations, namely in May, June, and August. It was not until June 1862, that I had an opportunity of observing the eggs, when I had the good fortune to discover some on the same poplar on which I had also found Nematus vallator, Nematus pallicercus, and likewise many Lepidoptera. The eggs were arranged in a very remarkable manner (see fig. 1): they were so arranged along the margin of a poplar-leaf that one egg was placed on each of the teeth of the leaf; I counted twelve on one side of the midrib, and eight on the other, inserted between the surfaces of the leaf. A couple of days later the young larvæ had made their appearance, and were ranged so closely together along the margin of the leaf (fig. 2) that each seemed to grudge the other the space it occupied, most of them having only room to hold on by the six thoracic legs; the anal extremity was almost continually in motion. About fourteen days later they were nearly full grown, when it was apparent that they belonged to the same species as those taken at Warmond: on attaining their full growth they were, however, nearly half as long again, being about 15 mm. These larvæ also produced the same imagos. The perfect insect is 8, 9, 10 or 11 mm. long; the male is smaller and darker coloured than the female. In both sexes the head is brownish black as far as the mouth, which is yellow; the antennæ are yellow underneath, the upper surface being fuliginous; the eyes are brown, and are surrounded—especially in the female—by a yellow border; the ocelli are topaz-coloured. Prothorax bright yellow, with a brown spot in the middle of the neck; mesothorax black, with some brown at the side in the male, which is replaced by a yellow spot in the female; metathorax brown-black (yellow beneath in the female.) Hartig speaks of a little yellow spot on the scutellum: I have not been able to observe this in my examples, which were taken inland. The cenchri are clear white. The female has the abdomen entirely orange; in the male this part of the body is spotted with brown or black on the dorsum, generally on the first two and the seventh segments. In the female the legs are yellow with brown claws, the posterior tarsi being brown on the upper side; in the male the bases of the posterior coxæ are black, the rest of the leg being entirely yellow, the brown tint being scarcely perceptible on the posterior tarsi. Wings transparent, with a yellow tinge in the female, and having a brownish purple glow at the base in the male; the costal nervure and the stigma are yellow, the latter being purplish at the base in the male. The nervures of the wing are of various tints of brown. The ovipositor and saw of the female are of the most simple structure, and offer nothing to call for special remark (see fig. 8). I may add that on the occasion of the excursion of the Netherland Entomological Society, in August, 1863, I saw the larva of this species in great numbers on a row of poplar trees not far from Wassenaar, near the villa of Ryxdorp.

Collected Observations on British Reptiles.

By EDWARD NEWMAN.

(Continued from S. S. 1598.)

Order II. CROCODILES (LORICATA).

Are covered with a very hard dermal envelope, which, on the back, is divided into departments or sections, each containing a somewhat square spongy bone firmly embedded in the skin, and forming part of the shield-like armature which has given rise to the name of Loricata. My late friend, Edward Doubleday, when in the United States, was at first puzzled with these curious substances: they were extremely numerous at a little bend of the river St. Johns, just below the town of Jacksonville in east Florida, but he soon found that they were the dermal bones of alligators, that had either died of a ripe old age—"exactis non infeliciter annis," or had fallen victims to the rifles of the militia and other troops constantly passing up and down the river in the steamers. The sections or divisions of the dermal envelope are generally furnished with a keel-like projection more or less developed, and these, being arranged in dorsal and caudal series, form long toothed crests, each series having somewhat the appearance of a gigantic saw. The legs are short and strong; the fore feet have five toes, and the hind feet four; the toes are usually connected by a swimming membrane; the head is long, and each jaw is furnished with a single row of deciduous teeth, which are renewed by new ones being formed within the base of the old, and pushing these out of their places: the lower jaw extends backwards beyond the skull, so that when the mouth is opened the upper jaw appears to be articulated and moveable as in parrots—but this is not the case; the upper jaw really forms an integral and very principal part of the skull; the tongue is fleshy and fixed in the recess between the branches of the lower jaw, not moveable and extensile as in endosteate animals generally. These creatures are strictly carnivorous; they inhabit the rivers of Asia, Africa, and America, and grow to an enormous size—sometimes, it is said, attaining a length of twenty-five feet, but I have never seen such in museums. None now inhabit Europe; indeed, the number of Loricata is everywhere diminishing: these huge reptiles are too powerful to amalgamate with Teutonic man; it is impossible for any community of interest to exist between him and the Loricata: there can be nothing but antagonism, and we know what that means when the Teuton is one of the contending parties—the Loricata must go to the wall. A hundred years ago the Red Indian and the alligator were "tenants in common" throughout the Floridas. Honest William Bartram, who was sent thither by Dr. Lettsom, of London, to collect botanical specimens, and who has never been suspected of the slightest tendency to exaggerate, draws the following life-portrait of the alligator at home. The *locale* is the bank of the St. John's river, the very spot where so many years afterwards Edward Doubleday found their dermal bones in such abundance. "How shall I express myself," says Bartram, "so as to convey an adequate idea of the scene, and at the same time avoid raising suspicions of my veracity? The river in this place, from shore to shore, and perhaps nearly half a mile above and below me, appeared to be one solid bank of fish of various kinds pushing through the narrow pass of St. Juan's into the little lake on their return down the river, and the alligators followed them in such incredible numbers and so close together, from shore to shore, that it would have been easy to have walked across on their heads had the animals been harmless. What expression can sufficiently declare the shocking scene that for some minutes continued, whilst this mighty army of fish were forcing the pass? Thousands, I may say hundreds of thousands of them, were caught and swallowed by the devouring alligators. I saw an alligator take up several great fish at a time out of the water, and just squeeze them between his jaws, while their tails flapped about his ears and eyes ere he could swallow them. The horrid noise of their closing jaws, their plunging amid the broken banks of fish, and rising with their prey some feet upright above the water, the floods of blood and water rushing from their mouths, and the clouds of vapour issuing from their wide nostrils, were truly frightful."*

All this is rather foreign to my purpose, but it will not be without interest to those who desire to study the reptile world. I now proceed to—

Order III. SAURIANS (SAURIA).

Are covered with a tough but often flexible dermal envelope in which no bones are embedded, but which has very numerous granular or squamiform divisions, often so exactly representing true scales as to have led even the most learned naturalists to call them by that name: their legs vary in number, and are four, two, or none; the tongue is also very various in form, and their mode of reproduction is different in different tribes—they agree, however, in having the bones of the head closely united, and in this respect differ from the snakes, in which these bones are separate. We have four members of this order supposed to inhabit Britain, and these belong to two families, called, by Lord Clermont, Lacertinidæ and Scincoideæ. In both instances I cite the characters given by this distinguished naturalist, not having sufficient knowledge of the exotic forms of either family to draw up original diagnoses.

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* 'Travels through North and South Carolina, Georgia, East and West Florida,' &c. By William Bartram. London, 1792.

Family LACERTINIDÆ.

"The body is prolonged, with four feet, having four or five claws, all provided with nails; the tail long, conical, often twice as long as the body; the head protected by horny many-sided plates; the belly covered with large scales; the tongue free, extensile, divided into two filaments towards the top; the eyelids are moveable."

Genus, LACERTA.

Of which the characters of the British species are those of the family.

THE GREEN LIZARD (*Lacerta viridis*).

Guernsey Lizard. Jersey Lizard.

Lacerta agilis, β. viridis. *Linneus, Faun. Suec.*, p. 289.

Lacerta viridis, *Dumeril and Bibron*, vol. v., p. 210; *Clermont, Quadrupeds and Reptiles of Europe*, p. 184.

The palate teeth are usually twelve on each side; the tongue is extensile and bifid at the extremity; the nose is rather pointed and the nostrils approximate; the fore feet extend to the nostrils, the hind feet to the commencement of the fore feet, or within a short distance of them; the tail comprises two-thirds of the length of the body; the scutes on the upper part of the neck and beginning of the back are oval and tectiform, becoming by degrees more hexagonal as they approach the tail; the scutes on the sides are oval, with a slight longitudinal elevation along their centres excepting in the three or four rows next to the ventral plates, which are quite flat; in a line drawn over the centre of the back, from one edge of the ventral region to the other, there are fifty scutes; the central plates are in eight rows, the outer ones being short and composed of small plates. The colour is generally vivid green; but in a specimen for nearly two years in my garden, this colour was mixed with yellow and brown in spots, and the belly and under parts were entirely yellow. The length is fourteen or fifteen inches. Although having had living specimens from Jersey in my possession at different times, I never took the opportunity of describing either of them, and am therefore induced to borrow from Lord Clermont's 'Quadrupeds and Reptiles of Europe' most of the foregoing details.

It now becomes needful to explain what claim this beautiful lizard may possess to a place in the British fauna. It is one thing to enforce the acceptance of conclusions drawn by competent observers *because these observers were competent ones*, and another to repeat their statements *because I know them to have been made in good faith*. The latter course I adopt, feeling that I have no right to call in question the statements however I may hesitate about the conclusions at which the several writers have arrived, and at the same time being perfectly aware that it would be a fatal error to insist on the validity of statements which we have now no means either of checking or of controverting. The first instance I shall cite of a British green lizard is most unfortunately Irish. "*Lacertus viridis:* THE GREEN LIZARD, a colore ita dicitur: vulgari major est. In Italia frequentissi habentur. Inveniuntur etiam in Hibernia. An Lacertus Hibernicus *Mus. Tradescanti*."—*Ray*, *Syn.* p. 264. Mr. Thompson, in his 'Natural History of Ireland,' vol. iv. p. 62, makes the following comment on this passage. "Our common lizard being occasionally of a greenish hue may possibly have led to the mistake, as persons have in several instances told me that they knew a green lizard to be native, but this always proved to be the common species." Mr. Thompson, I think, somewhat too hastily pronounces Ray's statement "a mistake": and again, having had great personal experience of Irish lizards, I may state very confidently I have never seen one to which Ray's words would apply, "The Green Lizard, a colore ita dicitur."

My next quotation is legitimately introduced: it was published in that choicest of all choice natural histories, 'White's Selborne.' Here it is: "I remember well to have seen formerly several beautiful green Lacerti on the sunny sand-banks near Farnham, in Surrey, and Ray admits there are such in Ireland."

Here Ray's supposed mistake is revived and republished. My third instance was published in the 'Zoologist' twenty years ago, by as scrupulously honest and truthful a man as it has ever been my lot to meet with in any walk in life, a man universally beloved and respected, Dr. Arnold Bromfield.

"I am told by very competent authority the Green Lizard has been found to be very frequent, and even abundant, at or in the neighbourhood of Herne Bay. I may add that there can be no doubt about the species, and that it is certainly not merely the smaller green lizard of Poole, but identical with the species long known to inhabit Guernsey, as my friend Professor Bell has received a specimen from Herne Bay, but not in time to notice the discovery in the second edition of his 'British Reptiles,' lately published. Mr. Bell supposed L. viridis must be only naturalized in its Kentish locality, but the difference of climate and latitude between Guernsey and Herne Bay is not so great but that we may conceive it very possible this beautiful reptile may be really indigenous to both places. It was only till very recently that the nativity of the edible frog (*Rana esculenta*, L.) was fully ascertained in England, although rumour had placed it long since in our indigenous lists. If I am not mistaken, the Lacerta viridis of Guernsey has been said to have been captured in this country, in which case we have now a similar confirmation of the fact, as in the instance of the Rana esculenta."—*William Arnold Bloomfield, in* '*Zoologist,*' p. 2707.

Will my friend Mr. Bell kindly inform the readers of the 'Zoologist' whether the Herne Bay specimen was really Lacerta viridis.

My next quotation is perhaps scarcely so much to the point, but still the character of the writer gives it a claim to serious consideration.

"Seven or eight years ago a schoolfellow of mine at Eton, a native of Guernsey, assured me he had seen lizards in Devonshire precisely similar to the green lizards of his own island, which latter, if I remember right, he had often caught and kept in confinement. Nearly two years since, a learned professor of the University of Edinburgh, mentioned that he had dissected a 'green lizard' brought by a botanical party from the Clova Mountains, of which however the remnants were not to be found, when search was, at my request, made for them."—*John Wolley, in* '*Zoologist,*' p. 2707.

We now arrive at positive evidence of the capture of a specimen of the green lizard near Dorking. On Friday evening, the 24th of April, 1863, Mr. J. A. Brewer, the secretary of the Holmesdale Natural History Club, exhibited the lizard at a meeting of that Club, and read the following paper respecting its capture and on the general character of its claim to be regarded as British :—

"The specimen now exhibited was caught by a labouring man on a bank by the side of the road, a little way out of Dorking on the road to Reigate, on Friday, April 3rd, 1863, and brought to me the same evening, when I purchased it for the Museum of the Holmesdale Natural History Club. This species, which is frequent in the islands of Jersey and Guernsey, and also in the South of Europe, has not been previously known to naturalists as an inhabitant of England, and is not included by Professer Bell in his valuable work on the British Reptiles, although he alludes to it as having been supposed to occur both in England and Ireland; but gives it as his opinion that green varieties of a much smaller species, Lacerta agilis, have been mistaken for it. The occurrence of this solitary specimen is not sufficient in itself to establish it as a British species; but on showing it, a few days since, to Mr. John E. Daniel, a well-known naturalist, and who certainly would not have been likely to mistake this beautiful species, he informed me that a few years since he had observed three or four specimens of it on the heath about half a mile south of Wareham, in Dorsetshire, one of which he captured, and is quite certain of its identity with Lacerta viridis, a species which he is well acquainted with, having frequently seen it in Germany, and received specimens from the Channel Islands. The proof, therefore, of its occurrence in England is established; whether indigenous or as a naturalized species, remaining doubtful; but there can be now no reason why it should not be added to the British fauna."—*J. A. Brewer, in the 'Zoologist,'* p. 8639.

Lastly, the Rev. J. G. Wood, in his 'Illustrated Natural History,' says—"I know of one instance where the true Lacerta viridis was captured and killed near Oxford, but I believe that it must have been a wanderer from one of the numerous fern-cases that are to be seen in so many houses."

THE SAND LIZARD (*Lacerta Stirpium*).

Lacerta agilis γ dorso punctis albis duplici serie. *Linneus, Faun. Suec.*, p. 289.

Lacerta agilis. *Bonap. Faun. Ital.* (with a figure); *Bell, British Reptiles*, p. 18 (with a figure).

Lacerta Stirpium, *Dum. et Bib.*, vol. v., p. 196; *Jenyns, Brit. Vert.*, p. 291; *Clermont, Quadrupeds and Reptiles of Europe*, p. 182.

The palate teeth are seven or eight on each side; the tongue is extensile and bifid at the extremity; the nostrils are placed near the outer or inferior margin of the nasal plate, and nearly half-way between the anterior and posterior margin; the nose is blunt. The fore legs scarcely reach to the eyes when stretched forward; the hind legs when stretched forward reach about half-way to the insertion of the fore legs: there are five toes on each foot, all of them furnished with nails; on the fore feet the third and fourth toes are longest and nearly equal in length; the first is generally the shortest, the second and fifth are scarcely longer, and nearly equal; on the hind feet the fourth toe is the longest, the third next, then the second, then the fifth, and the first is the shortest. The body is stout, and the tail is comparatively short, and tapers from the base. The colour of the male is brown, inclining to a more or less vivid green on the sides; the female is brown, without the green tint: in both sexes there is an indication of three slightly darker stripes, and in each of these are longitudinal series of black spots; these spots are of different shapes and sizes; in the lateral darker stripes is a series of somewhat ocellated black spots. Linneus, Professor Bell, and others, describe these spots as having white centres; but although the centres are manifestly paler, I never met with a specimen in which they could be called white. The belly is nearly white, sometimes more or less spotted with black.

Ecdysis takes place piecemeal, and I think only once in the year: during the process the animal looks very ragged.

It feeds on living insects, which it seizes with great rapidity, watching for flies settling in the sunshine. It is capable of long abstinence; some specimens taken by my late friend, Thomas Ingall, lived for a long time in confinement without being once seen to eat, yet they lost nothing in bulk: whether from timidity or not I am unable to say, but they resolutely refused food; exhibited a morose and irritable disposition; and were finally consigned to a bottle of spirits in as good condition as when they were caught.

“The female,” says Professor Bell, “lays her eggs, to the number of twelve or fourteen, in hollows in the sand, which she excavates for the purpose, and having covered them carefully with sand she leaves them to be hatched by the solar heat.”

It inhabits sandy localities, more particularly at Broadwater near Godalming, and Weybridge in Surrey, and Poole in Dorsetshire, but I am uncertain whether it occurs in Scotland or Ireland.

I believe Mr. Jenyns was the first English author who made out in a satisfactory manner that we had two nearly allied species of Lacerta in Britain: I have given above a reference to his diagnosis. The more familiar species is that which I shall next describe.

THE COMMON LIZARD (*Lacerta agilis*).

Scaly Lizard. Viviparous Lizard.

Lacerta agilis, *Linneus, Faun. Suec.*, 289; *Syst. Nat.* i., p. 363, n. 15; *Berkenhout, Synopsis,* i., 56; *Sheppard, in Linn. Trans.*, vol. vii., p. 49; *Fleming, British Animals,* p. 150; *Jenyns, Brit. Vert.,* p. 292.

Lacerta vivipara, *Jacquin, Nov. Act. Helv.*, i., p. 33 *t.*; *Clermont, Quadrupeds and Reptiles of Europe,* p. 183.

Zootoca vivipara, *Wagler, Syn. Amph.*, p. 155; *Bell, British Reptiles,* 2nd Edition.

Above is one of those instances to which B. D. Walsh, as cited in the 'Entomologist's Annual' for 1869, so touchingly alludes in the following passage:—

"To my mind, the naturalist who rakes out of the dust of old libraries some long-forgotten name, and demands that it shall take the place of a name of universal acceptance, ought to be indicted before the High Court of Science as a public nuisance, and, on conviction, sent to a scientific penitentiary and fed there for the whole remaining term of his scientific life upon a diet of chinch-bugs and formic acid."

Although perfectly aware that the Editor of the Annual would not level his anathema at so humble an individual as myself—perhaps he is ignorant of my existence—yet none the less am I conscious of deserving the rebuke, and will submit to the judgment of the "High Court of Science" whenever it shall be pronounced: I plead guilty to knowing that Linneus designated by the name of Lacerta "agilis" the little lizard I am about to describe: I know it was the α or type of his species "agilis": I also know that both his names—"Lacerta" and "agilis"—were adopted by the great continental naturalists of the day, and later by our own Fleming, Jenyns, and every British naturalist prior to Bell:—further, that I am aware that Jacquin the Younger made the discovery that the little creature was sometimes viviparous, and that, having made this discovery, he forthwith rechristened the lizard "Lacerta vivipara:" and still further, that Wagler, not considering the name a sufficiently dignified and emphatic record of its performance in parturition, still further altered the name to "Zootoca vivipara." I also know that the name "agilis" was thenceforward dropped altogether, or assigned to some other species: I am the naturalist who "rakes from the dust of old libraries" the name of "Lacerta agilis," and who now hopelessly attempts to restore it as originally applied, for which I anticipate the receipt of abundance of the promised formic acid, which I trust to be able to swallow with resignation.

My valued friend Mr. Bell thinks that the Linnean name of "agilis" should be confined to the Sand Lizard, and that the name of "vivipara," proposed by a school-boy eleven years of age,* should be given to the common lizard of Sweden and Britain. I think otherwise, and my argument would run thus:—

i. There is no doubt that the Lacerta agilis of the 'Fauna Suecica' was a common lizard in Sweden at the date of that invaluable work.

ii. Linneus makes three varieties of Lacerta agilis, or perhaps more rigidly speaking a type and two varieties; these are clearly differentiated, *first* by Linneus, and *subsequently* by Retzius and Müller. The type is Lacerta agilis. Var β is Lacertus viridis, of which Linneus says it is "very rare—I have never seen it." Var. γ has a double series of white spots on the back.

iii. These three varieties appear to me absolutely identical with the three species now described.

α. Agilis = Lacerta agilis, Common Lizard, Scaly Lizard, Viviparous Lizard, &c.

β. Viridis = Lacerta viridis, Green Lizard, Guernsey Lizard.

γ. Lacertus dorso punctis albis duplici serie = Lacerta Stirpium, Sand Lizard, Sandy Lizard.

It is extremely probable that the Green Lizard is introduced into the northern fauna by mistake, especially as Linneus expressly tells us that he has never met with it.

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* Such was the age of the precocious child who first, and perhaps who alone, has observed the remarkable character on which the distinctions of this species now rest.

The Common Lizard has no palate teeth; the maxillary teeth are minute and sharp-pointed; the nostrils are situated near the inferior margin of the nasal plate; the nose is rather acute; the tongue is bifid and extensile. The fore legs reach to the eyes or rather beyond them when stretched forward; the hind legs reach two-thirds of the way towards the insertion of the fore legs when stretched forward; there are five toes on each foot, all of them furnished with nails; on the fore feet, the third and fourth toes are longest, then the second and fifth, and the first is the shortest; on the hind feet the fourth toe is much the longest, then the third, second and fifth, and the first is much the shortest. The body is stout, the tail long and slender; it is of nearly the same thickness for the first half of its length, and then gradually tapers to a point: the colour of the back is brown in both sexes, with three longitudinal darker stripes from head to tail—of these the median or dorsal stripe is often obscure, the lateral stripes being more obvious: these stripes are more or less spotted with black.

This is, *par excellence*, the common lizard of Sweden and Northern Europe generally, and of England, Scotland and Ireland. St. Patrick, when he banished snakes, vipers and toads from the sister island, kindly allowed the lizard to remain, either influenced by its engaging manners or in consideration of its extreme insignificance, some of the Irish specimens, as Mr. Bewley informs us, not exceeding an inch in length. Lord Clermont tells us that "it is never found in low or flat countries but frequents mountain districts," a statement from which I am very disinclined to dissent, seeing how much care the noble author has bestowed on his valuable work; but it has been within the scope of my daily observation in the summer and autumn of every year for nearly half a century that this lizard is abundant about London and about Godalming, the only districts in which I have resided many years continuously, and both of which localities in reference to the sea level are decidedly "low." The common lizard exhibits a marked preference for the green sand formation overlying the chalk, and this is the surface soil both in its London and Godalming localities. I have never seen it on the mountains of Wales, Scotland or Ireland, but I am quite ready to admit the very slender value of merely negative evidence, especially as the tourist has not the same opportunities as the resident for making reliable observations.

In describing two animals so similar as our British lizards, it becomes necessary to make the distinctions rather comparative than positive. The following appear to me the more appreciable differences, none of which can however be regarded as very striking:—*First*, the nose of Stirpium is the more obtuse and rounded, the nose of Agilis the more acute; *secondly*, the legs of Stirpium are the shorter, as also is the tail; *thirdly*, Stirpium is the larger species; *fourthly*, in colour the females are very similar, but the males of Stirpium are much greener than those of Agilis; *fifthly*, I have described Stirpium as having palate teeth—Agilis has none; *sixthly*, the mode of reproduction is different—Stirpium, so far as observed, is oviparous, Agilis is what is termed ovo-viviparous, that is, the eggs are matured in the ovary of the female, but the young are extruded in a living and active state, the rupture of the shell or membrane covering the egg probably taking place, as Mr. Bell has suggested, in the act of parturition: this learned author also remarks that the young when brought forth are capable of running about, and "very shortly afterwards of taking their own food," an expression that seems to imply that in their earlier days they receive some kind of assistance in feeding: this inference may not be intended.

I trust I may be pardoned for writing of the character by which this species is distinguished in a somewhat less decided tone than has been adopted by more authoritative herpetologists. I confess to feeling a doubt as to the value of this character as observed; we want repeated observations of the same kind, and although the theory is beautifully illustrated by Mr. Bell, who represents one species in solitary and apathetic grandeur, and the other surrounded by her little ones as a hen with her chickens, this is scarcely the evidence that satisfies a naturalist. The Age of Romance in Natural History has been succeeded by an Age of Caution, which almost amounts to scepticism; both extremes are perhaps to be avoided, but the latter can scarcely lead us into glaring errors, a result which the former may now and then successfully achieve. Moreover, herpetologists are now so well aware that this physiological character is of such frequent occurrence amongst reptiles, and if employed indiscriminately would associate such dissimilar forms, that instead of employing it as a generic diagnosis it would be far better to note its occurrence when observed, without laying any particular stress on its value. It will not only be found frequent among the Lacertinidæ, the Scincoidæ and the Colubridæ, but it will appear exceptionally in species always regarded as oviparous.

A great deal of discussion has taken place in the daily and weekly papers on the subject of lizards receiving into their stomach as a place of refuge, their young ones when threatened with or fearing injury: the majority of the readers and writers in such journals are not naturalists—they know neither "what to observe" or "how to observe," and consequently their statements and arguments melt into thin air before the cross-examination which the mind of a naturalist is sure to bestow on them: nevertheless, the discussion has not been confined to non-naturalists, and excellent remarks have been made by naturalists—remarks well worthy of being transferred to these pages, but which I cannot readily so transfer on account of their obvious relation to other remarks which fall under the category of *aberrant.* The somewhat dogmatical character of a naturalist's mind has a tendency to pooh-pooh the statements in question; such is my own disposition: I don't know how to believe that a young and tender animal can remain in the strongly digestive stomach of a reptile and receive no injury; neither can I imagine what kind of instinct can teach the young of any animal to seek so dangerous a haven. But I wish my readers to peruse the following statements:—*First*, my late lamented friend, William Christy, jun., found a fine specimen of the common lizard, with two young ones; taking an interest in every thing relating to natural history, he put them into a small pocket vasculum or botany-box to bring home; but when he next opened the vasculum, the young ones had disappeared and the belly of the parent was greatly distended; he concluded she had devoured her own offspring: at night the vasculum was laid on a table, and the lizard was therefore at rest; in the morning the young ones had reappeared, and the mother was as lean as at first. *Secondly*, Mr. Henry Doubleday, of Epping, supplies the following information: a person, whose name is English, a good observer, and one as it were brought up at the feet of a Natural-History Gamaliel, once happened to set his foot on a common lizard in Epping Forest, and while the lizard was thus held down by his foot, he distinctly saw three young ones run out of her mouth; struck by such a phenomenon he killed and opened the old one, and found two other young ones in her stomach, which had been injured when he trod on her. In both these instances the narrators are of that class who do know "what to observe" and "how to observe" it; and the facts, whatever explanation they may admit, are not to be dismissed as the result of imagination or mistaken observation.

I can't find it in my heart to conclude these desultory notes without paying my humble tribute to the philosophic manner in which lizards part with their tails. My friend Mr. Bates tells us that in the Brazils "a slight rap will cause the tails of lizards to snap off, the loss being afterwards partially repaired by a new growth:" and, like a true naturalist, he goes on to philosophise on the matter thus—"The tails of lizards seem to be almost useless appendages to these animals; I used often to amuse myself in the suburbs, while resting in the verandah of our house during the heat of the day, by watching the variegated green, brown and yellow ground-lizards. They would come nimbly forward and commence grubbing with their fore feet and snouts around the roots of herbage, searching for insect larvæ. On the slightest alarm they would scamper off—their tails cocked up in the air as they waddled awkwardly away, evidently an encumbrance to them in their flight."* This throws the required light on the subject: you can scarcely look at one of our lizards without his throwing off the useless encumbrance with which nature has loaded him. I believe I may say a school-boy *never* seizes a lizard by his tail, but the overjoyed creature leaves the useless appendage between his fingers, in which position it will wriggle and twist until the astonished lad is glad to release his useless captive; and dropping it on the ground its violent demonstrations of vitality are again renewed, and are sometimes continued for the space of an hour. The bleeding stump from which the tail has been discarded soon heals over, and before long nature produces a new tail in the place of the old one: this reproductive power is almost as marvellous as the self-mutilating power by which the tail is discarded, and both require that careful investigation which has not yet been given to them. We shall see hereafter that this mutilation has, under certain circumstances, a bearing on that natural instinct, the preservation of life; for those snakes which feed on lizards almost invariably seize their retreating victim by the tail, and no sooner is this abandoned by the rightful owner to its inevitable fate, than the snake makes sure of this "sop thrown to Cerberus," and suffers the tailless lizard to generate a new caudal encumbrance at leisure. The mutilation has sometimes a most curious effect, by which the lizard may be said to be a gainer, for the stump not unfrequently produces two tails instead of one.

EDWARD NEWMAN.

(To be continued.)

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* 'Naturalist on the Amazon,' vol. i., p. 17.

Rough Notes from the Channel Islands.

By J. A. HARVIE BROWN, Esq.

(Continued from Zool. S. S. 1592).

ON February the 15th my guide—George Vauden—and I started from the inn, with the intention of exploring the wild coast scenery of the island. First visited the Creux de Derrible, a very fine creux indeed, very much finer than the one before described which I saw in Herm. One side of this creux is nearly 300 feet in perpendicular height, but the other is not nearly so high nor so precipitous; it has communication with the sea beneath by two lateral openings, and at high tide, with a rough south-west wind blowing, it must be indeed a grand sight to see the great waves come dashing through these narrow passages. We now passed on along the rocky coast to d'Iscart Bay, a rugged, weather-beaten and picturesque bay, with a beautiful wooded valley opening upon it from the landward side, and a smooth sandy little bit of bathing beach with an arched rock at one side. Then proceeded to the coupée, where the road connecting Sark and Little Sark runs along the top of a narrow ridge, and is only about seven feet in width, with a nearly perpendicular cliff on one side of 300 feet in neight, and on the other side a steeply sloping bank—about 75 degrees—down to the sea. In a high wind such as was blowing on the day I visited it, it was anything but a pleasant sensation passing along this narrow path. The view of the rock scenery of Little Sark as seen from the northern extremity of the coupée is very fine, and in some respects may be said to resemble a certain view of Kynance Cove, at the Lizard in Cornwall. The view from the south end of the coupée, looking northwards, embraces all the line of coast south of the Guliôt caves, takes in the Island of Brehon, which is only separated from Sark by a narrow channel of deep water, and beyond, Herm and its north-east shell beach, and the northern and low lying portion of Guernsey. After exploring one or two "queer places" in the rocks we pushed on towards the famous Guliôt caves, but on arriving found we could not effect an entrance owing to the tides. We did get into the outer cave, but its wonders (Vauden said) were nothing to be compared with the other and inner cave: nevertheless I was sufficiently struck with the forms of marine life which even here completely covered and hid from view every square inch of the sides of the cave. Hundreds and thousands of the curious brittle acorn barnacles clustered from floor to roof of the cavern, many of them growing to a great size. Specimens which I took away with me and kept alive in sea water were most beautiful creatures when closely examined, as they threw out their little bag-like, net-like feelers, in search of their microscopic food. Another part of this cave was perfectly covered with sea-anemones of every shade of red, brown, green, orange and purple. There were also corallines and sponges, some of the latter yellow, some orange, some red. How I longed to enter the inner cave, to see the tubularias and hairy urchins and seaweeds and fishes of the pools, but it was not to be. The tides would not permit until the 29th of February, and until then we could not stay; and it was with no inconsiderable amount of regret that I turned my face homewards without having seen these wonders of the deep. *Perhaps* another time I may, who knows.

The Boutiques Caverns were well worth visiting, though, curiously enough, scarce any sign of marine life is to be found in them, though apparently quite as well suited for it as the Guliôt caves. These caverns have never been thoroughly explored, and there is one branch cavern that no one has ever been to the end of. At high-tide all these caves are full of water, so that it would be dangerous to venture too far in. Another fine set of caverns are those of Grève de Ville. One of these caves is of great altitude inside, and communicates with the open air above by means of a small round opening through which the sun-light streams in, and illuminates the whole roof and sides of the cave. In course of time, perhaps, the thin crust of earth and rock which covers this great cave will fall in, the debris be washed away by the ever restless sea, and finally another creux be formed upon a grander scale than the Creux de Derrible. I ought not to quit the subject without mentioning the Creux Harbour of Sark. This is a little semicircular bay on the east coast of Sark, hemmed in by high perpendicular cliffs. Across the opening of this bay a pier is now being built which will render it a safe though rather confined harbour. The only communication with the interior of the island from this bay is by means of a long tunnel cut in the cliff, and by a steeply sloping road leading to the centre of the island. The view of this harbour, as seen from the end of the breakwater and pier, is very peculiar, especially as the tunnel being quite straight, affords a view of the quarrying and other work which is going on at the other end. Of the natural history of Sark I had but few opportunities of judging, as I missed seeing the Guliôt caves to advantage.

I am afraid you will find this a somewhat lame account of the beautiful Island of Sark, but were I to enter more into the particulars of its scenery, I fear I should be only repeating what Black's 'Guide Book' has already most amply treated of, and which Prof. Ansted's 'Channel Islands' may be said to have already exhausted.

JOHN A. HARVIE BROWN.

Preservation of Sea Fowl.

(The Introductory Observations are abridged from the 'Field' of March 13th.)

MUCH has been said of late respecting the expediency, or otherwise, of providing by statute for the preservation of sea fowl, and with good reason. Naturalists have observed with regret the wanton and indiscriminate slaughter of birds which has for some time past been taking place on all parts of the coast without any regard to season. Whether the pleasure-seekers, the *plumassiers*, or the leaders of female fashion are the most to blame, we will not here inquire; suffice it to say that the birds are destroyed by hundreds, nay thousands, and principally at a time of year when they have eggs or young in their nests. Were the birds thus taken used as food, there would be some excuse; were they killed at any other time of the year, except in the nesting season, there would not be such ground of complaint. Under the system which at present prevails, the extinction of many beautiful species of sea fowl seems imminent. It becomes a question, then, whether the aid of Parliament should not be invoked to avert an event so undesirable.

But it may be asked of what use are these birds, after all? Supposing they are protected by law during the nesting time, what then? There is a very complete answer. The evidence of mariners, fishermen, agriculturists and naturalists tends abundantly to prove that the various species of gulls deserve protection for many reasons. They are useful to mariners in warning them off rocks, shoals, and other dangers of the sea; acting, in fact, as living fog-signals. They are useful to fishermen in directing them to the most productive fishing grounds. The fishermen always know where there is a shoal of fish by the movements of the gulls, which fly round and round the shoal, now and then swooping to take a fish as it rises to the surface. Were it not for this aid much time would be wasted, with much wear of nets, Many species of gulls follow the plough, and destroy quantities of grubs and worms, which they snatch from the upturned soil. As scavengers, these birds are most useful in removing various kinds of offal from our shores and harbours. In addition to this, who will not readily admit that the presence of these wild birds on our coast contributes very greatly to the beauty of the scenery.

On all or any of these grounds, they deserve protection. And what is this to amount to? Simply the appointment and observance of a "fence time," as in the case of game and fish. Let them be unmolested for a certain period of the year, to rear their young and perpetuate their species.

In furtherance of these views, the following draft of a Bill has been prepared by Mr. J. E. Harting, and submitted to the House of Commons:—

"Whereas large numbers of sea-fowl are wantonly every year taken and destroyed on the coasts of England and Wales, without any regard to season, whereby the extinction of such sea-fowl is threatened: and whereas the said sea-fowl are of signal service to mariners on the said coasts, in warning them off rocks, shoals and other dangers of the sea; and also to fishermen on the said coasts, in directing them to the most productive fishing-grounds; and the said sea-fowl are also of use for sanitary purposes in removing various kinds of offal from the harbours and shores of sea-port towns; and further, that the said sea-fowl contribute much to the beauty of coast-scenery: and it is therefore expedient to protect such sea-fowl during the breeding season, and to prevent their eggs from being taken or destroyed:

"Be it therefore enacted by the Queen's Most Excellent Majesty, by and with the advice and consent of the Lords spiritual and temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

"1.—This Act may be cited as 'The Sea-Fowl Preservation Act, 1869.'

"2.—The words 'sea-fowl' shall for all the purposes of this Act be deemed to include the different species of gulls, auks, guillemots, cormorants, puffins, terns, skuas, petrels, gannets, divers, razorbills, shearwaters and grebes.

"3.—Any person who shall kill, wound or take any sea-fowl, or use any boat, gun, net or other engine or instrument, for the purpose of killing, wounding or taking any sea-fowl, or shall have in his control or possession any sea-fowl recently killed, wounded or taken, between the first day of May and the first day of August in any year, shall on conviction of any such offence before a justice or justices of the peace forfeit and pay for every such sea-fowl so killed, wounded or taken, or so in his possession as aforesaid, such sum of money not exceeding twenty shillings as to the said justice or justices shall seem meet, together with the costs of such conviction.

"4.—Any person who shall wilfully take out of the nest or destroy in the nest the eggs or young of any sea-fowl, between the first day of May and the first day of August in any year, shall on conviction thereof before a justice or justices of the peace forfeit and pay for every such egg or young bird so taken or destroyed, such sum of money not exceeding five shillings as to the said justice or justices shall seem meet, together with the costs of such conviction.

"5.—Any person who shall expose or offer for sale any sea-fowl, or the eggs or young of any sea-fowl, between the first day of May and the first day of August in any year, shall on conviction thereof before a justice or justices of the peace forfeit and pay for every such sea-fowl, egg or young bird, so exposed or offered for sale as aforesaid, such sum of money not exceeding five shillings as to the said justice or justices shall seem meet, together with the costs of such conviction, unless it shall be proved to the satisfaction of the said justice or justices that the said sea-fowl, eggs or young birds so exposed or offered for sale as aforesaid have been taken previously to the first day of May or subsequently to the first day of August, or have been taken or received out of England or Wales.

"6.—Where any offence under this Act is committed in or upon any waters forming the boundary between any two counties, districts of quarter sessions, or petty sessions, such offence may be prosecuted before any justice or justices of the peace in either of such counties or districts.

"7.—Any offence committed under this Act on the sea-coast or at sea beyond the ordinary jurisdiction of any justice or justices of the peace, shall be deemed to have been committed within the body of any county abutting on such sea-coast, or adjoining such sea, and may be tried and punished accordingly.

"8.—Any person who shall so offend as aforesaid may be required by any constable, coastguard-officer, gamekeeper, or by any other person holding a license to kill game, to tell his Christian name, surname, and place of abode, and in case such person, after being so required, shall offend by refusing to tell his real name or place of abode, such person shall, upon being convicted of any such offence before a justice or justices of the peace, forfeit and pay, in addition to any penalties incurred under Sections 3, 4 & 5 of this Act, such sum of money not exceeding twenty shillings as to the convicting justice or justices shall seem meet, together with the costs of such conviction.

"9.—The penalties incurred under this Act shall in all prosecutions at the instance of any person authorized by Section 6, be paid and applied in manner following, that is to say, one moiety of every such penalty shall go and be paid to the person who shall inform and prosecute for the same, and the other moiety shall be paid and applied in such manner as the said justice or justices may direct.

"10.—This Act shall come into operation on the first day of May next after the passing hereof.

"11.—This Act shall not extend to Scotland or Ireland."

On Wednesday, March 10th, an influential meeting was held at the Havover Square Rooms, to consider the Bill now before Parliament for the preservation of sea-fowl during the breeding season.

Mr. Sykes, M.P., who had introduced the Bill, occupied the chair; and amongst those present were the Hon. W. O. Stanley, M.P.; Mr. R. Ward Jackson, M.P.; Mr. Clay, M.P.; Mr. R. Winn, M.P.; Lord Alfred Churchill; Lord Clermont; Vicount Walden, President of the Zoological Society; Mr. C. B. Denison, M.P.; Sir G. Grey, Gen. Buckley, Col. Ainslie, Col. Mountjoy Martyn, Lieut.-Col. Fyers, Lieut.-Col. Hall, Prof A. Newton; P. L. Sclater, F.R.S., Secretary to the Zoological Society; W. H. Flower, F.R.S.; Dr. A. Günther, F.R.S.; Robert Hudson, F.R.S.; Edward Blyth, F.Z.S.; Osbert Salvin, F.L.S., F.Z.S.; J. E. Harting, F.L.S., F.Z.S.; W. H. Huddlestone, F.L.S., F.Z.S.; A. W. Crichton, F.L.S., F.Z.S.; H. E. Dresser, F.Z.S.; G. Cavendish Taylor, F.Z.S.; F. H. Lascelles, F.Z.S.; Dr. Crisp, Dr. Armitage, Edward Alston, J. H. Belfrage, W. M. Wilkinson, Francis Darwin, Henry Lee, Frank Buckland, T. Harland, Rev. H. Barnes, Rev. F. O. Morris, Rev. H. Ward, R. Palmer, J. Dennis, E. Dymond, F. W. Lucas, W. B. Tegetmeier, R. B. Sharpe, and many others.

Letters of apology were read from His Royal Highness Prince

Christian, Lord Tredegar, General Seymour, Dr. Percival Wright, Rev. H. B. Tristram, Mr. F. H. Salvin and Miss Burdett Coutts.

The Chairman, after some prefatory remarks, stated that there were three points on which he especially wished to have the opinion of the meeting. *First*, whether the eggs of sea-fowl ought to be protected as well as the birds; *secondly*, whether any and what provision should be made in cases where the young birds were taken for food; and, *thirdly*, at what dates respectively should the "close-time" commence and end. Before proceeding to discuss these points, however, two resolutions would be submitted to the meeting.

Professor Newton then moved "That this meeting being convinced that the sea-fowl are rapidly decreasing in number on all parts of the coast, owing to the practice of destroying them at all periods of the year, feels persuaded that legislative action is necessary to ensure their preservation."

This resolution was seconded by the Hon. W. O. Stanley, and carried unanimously.

Mr. F. Buckland, seconded by the Rev. F. O. Morris, then moved "That this meeting recognizing the utility of the said sea-fowl, protests against the cruelty of killing them during the breeding time, and pledges itself to support the Bill introduced by Mr. Sykes for their preservation at that season."

This was also carried unanimously.

The three points referred to by the Chairman were then discussed *seriatim*.

Professor Newton considered that with regard to these, there was ground for much difference of opinion. He himself would object to a clause providing for the protection of eggs, as under ordinary circumstances the taking of them conduced but little to the diminution of the number of sea-birds. In parts of the country with which he was acquainted persons farmed out meres for certain rents to others, who were entitled to the eggs laid thereon. It was plain that the owners of these meres would not do anything which would cut off the supply from which they derived their revenue. Certain cases should, of course, be decided according to the character of seasons and localities. He might mention that the eggs of the black-headed gull were frequently sent to London, and sold as plovers' eggs. As regarded killing birds for food, that did not prevail much in England, but in Scotland and the islands near it it would be utterly impossible to try to prevent the people taking these birds for purposes of sustenance. The earlier the beginning of the close season was dated from the better.

The Hon. W. O. Stanley, M.P., spoke of the protection against shipwreck sea-birds afforded on the coast, and read a letter in which the testimony of the brethren of Trinity-house, to the same effect, was emphatically given. He felt that permission to take eggs in certain localities would render the proposed Bill inoperative. Perhaps a clause might be inserted in which the cases of taking eggs on inland lakes might be excepted. He thought that the close-season should date from about the 12th of April to the 12th of August. He suggested that in cases where sea-birds were necessary as articles of food, magistrates and sheriffs might be empowered to grant licences for killing them.

Lord Alfred Churchill thought the Act should apply to the coast within one mile of the foreshore.

Mr. Winn, M.P., spoke of the increase in the number of birds which had occurred in North Lincolnshire since the killing of them had been prohibited. He thought that the close-season should begin about the 12th of March and end about the middle of July, when the young birds were quite strong on the wing and able to protect themselves.

In reply to a question from Mr. Cavendish Taylor, the chairman said it was proposed to extend the provisions of the Bill to Ireland.

In reply to a question from Mr. Banting, it was stated that while 100,000 sea-birds per year were killed for mere pleasure, only 12,000 were killed for purposes of trade.

Dr. Crisp said that a gull would destroy a ton of fish in the course of a year. He did not mean that literally, as the fish had not attained their full size, but what a gull consumed in the year represented that amount.

The Rev. F. H. Barnes said that gulls generally caught the fry of whiting. Say that the gulls consumed 2,000,000 or 3,000,000 of these fry in the year, in the same time whitings would destroy 900,000,000 fry of herrings and other fish.

The Hon. W. O. Stanley said that if the sailors of England were polled they would be found to be in favour of sea-birds, on account of the warning of danger their presence often afforded. In the Isle of Man there was a law in force, which possessed very stringent provisions regarding the destruction of these birds.

Dr. Günther was of opinion that the cormorant should be omitted from the list of birds to be protected, on the ground that it is very destructive to fish,—that it is not sought after for the sake of its plumes like the gulls,—and that from its wariness and great power in diving, it is able to avoid the wholesale destruction to which other birds were subject.

Mr. H. E. Dresser thought that the words "sea-fowl" would be more applicable than "sea-birds" in the Bill as it now stood, inasmuch as the latter term was too comprehensive, it being intended only to protect those birds which are web-footed and swim. For this reason he proposed that the words "sea-fowl" should be substituted, and that the name "oyster catcher" should be struck out.

Mr. J. E. Harting considered it expedient to protect the eggs equally with the birds, since as much destruction of life might be effected by wantonly robbing the nests as by killing the old birds. He thought that a date might be fixed previously to which a sufficient number of eggs might be taken, for food or otherwise, without a penalty, and subsequently to which, under a penalty for taking them, there would still be time for a second or third brood to be reared. He objected to the proviso which had been introduced in the second section of the Bill as it now stood, which was to the effect that no penalty should attach for killing the birds *bonâ fide* for the purpose of food, because he considered that such a proviso would render the section inoperative. Every person who killed a gull in the breeding season would say that he intended to eat it, and the Act would be evaded at every turn. He observed that none of the previous speakers appeared to have considered the practical working of the Act, which was of more importance than many supposed.

Mr. Harland submitted that the speaker was out of order in referring to a question which had not been mentioned by the Chairman, and thought there was no necessity for bringing it before the meeting.

Professor Newton could not agree with Mr. Harland. He considered that the practical working of the Act was most important, and that it would be extremely vexatious to find, after passing the Act, that there was any difficulty in carrying it into effect.

Mr. Harting then proceeded to point out the legal effect of certain words in several sections of the Bill as it now stood, and proposed certain amendments.

An animated discussion then followed, in which Mr. Francis Darwin, Mr. Jackson Gillbanks and others took part.

Mr. Blyth considered it unnecessary to extend the Act to such species as breed inland, as for instance the black-headed gull. He thought that this species would be sufficiently protected by the owners of the soil on which it is found nesting, and that as the eggs taken for food are almost invariably those of the black-headed gull, he believed that if these were excepted in the Act, there would be no objection to protecting the others.

The following resolutions were then put to the Meeting, and carried:—

1.—That the Bill should contain a clause for the protection of the eggs.

2.—That a proviso should be inserted to the effect, that no penalty should attach for taking birds unable to fly *bonâ fide* for the purpose of food.

3.—That the close-time should commence on the first of April and expire on the first of August.

A vote of thanks to the Chairman then terminated the proceedings.

Notes on the Great Auk.

By J. H. GURNEY, jun., Esq., F.Z.S.

OF the great auks alluded to in my previous paper (Zool. SS. 1442) the Cork specimen and the one found dead at Lundy Island are not accounted for; probably neither were fit to stuff; nevertheless, it is much to be regretted they were not kept for the sake of the skeletons. The remainder are in collections; according to Yarrell, more than two occurred at St. Kilda; at any rate there is no known *English* specimen of the great auk existing,—although, of course, there is not the least reason why the Durham specimen that the Rev. J. Gisborne bought for £8 should not be English-killed, or the bird that belonged to the old Wycliffe Museum (which is a young one changing into winter plumage), now at Newcastle. The latter, in all likelihood, is English: according to Latham, the young great auks used not unfrequently to be blown ashore. This bird Mr. Hancock re-stuffed two or three years ago; from it, and from Mr. Hancock's own beautiful specimen, every bone has been extracted: on placing the two skulls side by side, it is observable that the orbit is completely formed in the adult, while in the young one the socket is imperfect. Mr. Hancock was good enough to point out to me how this held good in the razorbill. I have been favoured with a photograph of this very old specimen, mentioned both by Donovan and Latham. I may here remark that the cut in Bewick's book was (as I learn from Mr. Hancock) principally taken from Edward's figure.

As every one knows, the great auk, the penguin of our northern seas, had no powers of flight, on account of the modification of the extremities *only* of its wings. While its humerus, says Prof. Newton, is in proportion with the bulk of the body, and fully twice the length that it is in the razorbill, the ulna, radius and metacarpus are nearly the same length in both species, only much thickened in the gare fowl (Ibis, Oct. 1861). Until Messrs. Newton and Wolley searched the "kitchen middins," and Mr. Hancock extracted two skulls, the want of great auk bones had been greatly felt; but an almost perfect exampleof the great auk, in a mummy state and destitute of feathers, was a few years ago found by the Bishop of Newfoundland while on a missionary cruize, at Funk Island, and forwarded to the British Museum by the President of the Nova Scotia Institute of Natural Science; and more recently bones have been found in Caithness.

It does not come within the scope of this little paper to say much about the osteology of the Alcadæ, but it may be worth mentioning that I have a number of razorbill breastbones, which differ from the great auk's in this respect, that there is a notch in the hind margin on either side the keel.

Mr. Proctor has handed me a photograph of the specimen in the Durham Museum; it rests upon its tarsus: Mr. Proctor says that when he re-stuffed it, he found the skin peel off, showing it must have been high when skinned. I observed that the bill was varnished over, so that the nostril had become invisible. The white eye-spot is neither so large nor so conspicuous as in Mr. Hancock's bird; however, the specimen is in excellent preservation, and Mr. Proctor has it under a separate shade, whereas the York one was, until lately, thrust in with a lot of other Alcadæ, forming part of the Rudston Read collection. This York specimen once belonged to the keeper of the Surrey Zoological Gardens, who sold it to Mr. Allis, who sold it to Mr. J. Bell, M.P., whose nephew gave it to the Museum. Mr. Daniel Graham, the well-known taxidermist, has given me its photograph: the white eye-spots, likened by Clusius to a pair of spectacles, show as pure as possible, and the orbit is not included in this white space, as seems to be the case with the Papa Westra specimen preserved in the British Museum. The two mandibles of the bill do not fit into one another, apparently because they have been tied with a string, the mark of which is visible.

At the demise of Mr. Arthur Strickland, the great auk formerly in that naturalist's collection passed with his other birds to the Museum at York; consequently this Museum can now boast of two great auks. The new comer is an adult in summer plumage. When it came to be cleaned it was found that there was no stuffing in it, and that the body was simply kept in position by wires. Both the York birds are in excellent preservation.

Of about seventy specimens of the great auk, which I am informed exist in this country, in public and private collections, I cannot ascertain that one is in winter plumage (the nearest approach being the one at Dublin); and I have not seen it so represented in any picture except Lewin's and Donovan's, the latter of whom drew from the specimen which formerly stood in the Leverian Museum, which consequently must have been killed in the winter time, and can no longer be in existence.

I venture to offer the following description of the great auk's winter plumage (giving my authority):—The large patch of white between the bill and eye, mottled with blackish feathers (Dr. Burkitt's specimen, a photograph of which has been sent me by Mr. Newton, and Dr. Charlton's statement that according to Benicke, a writer in Oken's 'Isis' for 1824, the eye-spot becomes in winter of a dark brown, interspersed with a few white feathers); chin, throat and front of neck white (Dr. Fleming's specimen). It appears to have undergone much the same change as the guillemot and razorbill; and the feathers in a fresh-killed specimen must have been soft, even and glossy.

Olaus Wormius' bird, to be mentioned afterwards, was a young one, "for it had not arrived to that bigness as to exceed a common goose" (Musci, lib. iii. cap. 19); and I may here remark, that all writers on the great auk have a marvellous knack of comparing it to a goose, which it resembled in nothing except its stupidity.

The bill of the great auk is thick and truncated, and it is marked with several lateral furrows: now the furrows in the kindred species, A. torda, are white, and I fancy many naturalists have an idea they should be white in A. impennis. I thought so until I read a passage in Willughby saying that the penguin's (A. impennis) differs from the auk's (A. torda) bill in that it hath no white lines. Ray likewise says in the 'Synopsis Avium,'—"Nullæ autem in rostro lineæ albæ sunt, quemadmodum in alka." On the other hand, what Ray and Willughby say is quite upset by the fact, that the two auks in the York

Museum *have* the ribs upon the bill white, and Mr. Graham, who has handled both, is confident they have not been painted.

The description in 'Willughby's Ornithology' (published 1676) was taken from a dried specimen in the Repository of the Royal Society, but the figure is apparently copied from Wormius, and is extremely interesting as being the earliest picture we have, and also because it was taken from a living bird* brought from the Ferroe Islands; and that being so, the error of the white ring round the neck (which has been repeatedly remarked on) is very strange. Perhaps, after all, it is intended for a collar such as Chinese cormorants have.

Sir Thos. Brown and other contemporaries of Ray and Willughby, make no allusion to the great auk; and it is worthy of remark that it is omitted in Ray's 'Catalogue of English Birds' (compiled from the labours of Willughby), so there is nothing to show that Willughby considered the great auk British.

It is curious to speculate on the habits and economy of an extinct bird. For ten months out of the twelve the great auk, since it could not fly, must have been on the sea; it is scarcely conceivable that for ten months this bird should never have been out of the water a minute.

According to Selby and Latham, the great auk was particularly fond of the ugly lump-fish and father-lasher, and the young were said to eat rose-root (Rhodiola rosea). The father-lasher, as I am informed by Mr. Hancock, is a fish that keeps at the bottom of the sea, and only a good diver like the great auk could feed on it.

The great auk is always accredited with having possessed rapidity and astonishing velocity under water, but its feet have not the beautiful mechanism that belongs to the great northern diver (Yarrell, Brit. Birds iii. 334), and it is improbable that it surpassed that bird in the distance it could dive. The old ones are reported to have been very rarely seen on shore, though the young ones used not unfrequently to be met with; just as we see twenty blackbilled auks for one adult razorbill. According to Latham the skin between the jaws was blown into a bladder, and used for the darts of the Greenlanders, but I confess I do not see how this could have been done, and am very doubtful of the great auk's existence at any time in those icy regions. The Esquimaux are said to have used the skin for garments, and Mr. Harrison Penney, of Darlington, has articles of apparel made from the skin and feathers of the rock-breeding sea-fowl, given him by the Moravian Missionaries, who, by the bye, on the authority of Dr. Charlton, were once guilty of eating a great auk by mistake for a wild goose.

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* The fact that it is drawn resting upon the length of the tarsus is a sufficient proof that the picture is from life.

The great auk has given rise to many tales and stories. One day Mr. Hancock received a visit from the Edinburgh birdstuffer, Mr. Small, who, on being shown a tray of auks' eggs and plaster casts, stated that he had recently seen a sailor offering one for £3; the sailor had been told it was valuable, when at Liverpool: he was carrying it in his jacket pocket upon a string, like an ostrich's egg. On hearing this, the late Mr. Wolley, who chanced to be in Newcastle, without loss of time started in chase, and dogged the sailor with indefatigable perseverance, coming up with him just too late, for the man was drunk, and the egg lost or broken.

Mr. Hancock's is, I believe, the only egg blown with a single hole, from which we may infer it was one of the very last taken. The Rev. H. B. Tristram has one of the last, taken at Gier-fugle shier, south of Iceland, in 1834. Most of the eggs existing in collections have been imitated in plaster at one time or another. The best casts are those by Mr. Hancock, who can produce a drawer full to all appearance of veritable great auk's eggs,—in reality they are all shams but one,—but the resemblance is so perfect that, without touching, it is almost impossible to say which is the real egg. It took Mr. H. sixteen days to colour his plaster imitation of the late Earl Derby's egg, which was so foul when he received it that it had to be washed.

The great auk is such a valuable bird that a history is attached to almost every specimen, real or sham. Mr. Masters, of Norwich, possesses an imitation great auk, which I am told is very good: it was made by his servant, Samuel Bligh, and the bill is of wood. Mr. Proctor, of the Durham University Museum, has also manufactured a great auk quite recently. The black parts are Brunnich's guillemot, and the breast is a northern diver's; and this fictitious bird, now in my possession, contains a few feathers of the real great auk in the region of the neck.

J. H. GURNEY, Jun.

Bank, Darlington.

Slaughter of Sea-fowl at Weston-super-Mare.—During the winter Weston Bay is frequented by large flocks of gulls, which are attracted by the shoals of sprats then to be found in its shallow waters. The kittiwake is by far the most numerous of the gull tribes which then put in their claim to a share in the fish harvest. But this last winter the gulls themselves have been more than usually persecuted: they came to capture, and have themselves been taken. There are always a few desultory shooters on the watch for them; but this season the campaign against them was methodically organized. Our fishermen found that, in consequence of the great demand for gulls' wings for ladies' hats, it would be quite as profitable for them to shoot the birds as to attend to their nets. The gulls were tempted within gun-shot by broken sprats being thrown overboard, and when one was killed it was allowed to float upon the water to attract the curiosity of its companions and to draw them within range. This method of shooting appears to have been a very successful one, as I have been told of gunners bringing back forty or fifty gulls each after a morning's work, and I have myself met the men returning more than once with large panniers laden with dead gulls. One of the fishermen told me that he had noticed several minute gulls in company with the others: he brought me one which he had shot, and this is a very pretty specimen of the little gull in a state of plumage which very closely resembles that of the "tarrock," or young kittiwake, with the black patch on either side the neck behind the ear, and the black upper wing-coverts, which are the well-known characteristics of the tarrock. Another boatman shot an old fulmar, not a common visitor to our southern coasts. I am very glad to see there is some chance of the gulls and other cliff-birds obtaining protection during the breeding-season, for with the present rage for feathers of all description, there seemed a prospect that every handsome bird which could be obtained by powder and shot was doomed to extermination. No lover of Nature would care to miss the gull from the shore, and missed he will be if something is not soon done to protect him. I am told that here in Weston a great number of gulls were sold and eaten, the price obtained being about twopence for each bird.—*M. A. Mathew; Weston-super-Mare, February* 23, 1869.

American Robin.—Some readers of the 'Zoologist' may not perhaps be aware that the American robin is a thrush (*Turdus migratorius*), which will account for the use of mud in its nest, as related in the interesting anecdote in the March number (S. S. 1604). This bird receives all the attention and kindness, and immunity from destruction, in America, that our redbreast does in England: and Nuttall tells us that the "babes in the wood" legend has extended to the American robin. It has the throat and the upper part of the chest black, with the rest of the under parts rufous. Is the tameness and domestic character of the American robin due to the name which some early settler from England gave it? or is it by nature confiding and fond of the society of man, thus earning for itself the name which an emigrant Englishman would always hold dear? Wilson tells us that schoolboys hold the nest of the "robin" in America more sacred than that of other birds. Neither his "red breast" nor his confiding habits, however, prevent his being shot in the winter and sold in the public markets for food.—*C. R. Bree; March* 8, 1869.

Pugnacity of the Wren.—The pugnacity of the wren is well known to all who observe the habits of birds; but I wish to record an instance which recently came under my notice here. Accompanied by my wife and brother, I was walking past an ivy-clad rock, when our attention was attracted by a rustling among the leaves, and in a few moments down came the objects which were causing the disturbance, in the shape of two wrens closed in desperate conflict. They continued the combat at our feet, and we managed to capture one of them under a hat, the other making its escape to the top of the rock, and immediately giving out its vigorous notes of defiance. On our prisoner being released he forthwith returned the challenge in notes equally loud; and in less than a minute the two had again closed, and again came to the ground struggling together. A second time one of them was caught under the hat, but it got away, and lost no time in answering the note of battle already sounded by its antagonist. The contest was resumed for the third time, and with the same result, the two falling to the ground together as before. We attempted another capture, but failed. Whether the defiant notes which were again sent forth ended in a fourth battle we did not stop to ascertain. We noticed that in closing they grasped each other's feet and fought with their beaks.—*James Murton; Silverdale, Lancaster, March* 17, 1869.

Purple Sandpiper at Weston-super-Mare.—On the 21st of January last I shot a purple sandpiper near Weston-super-Mare: it was a female specimen, and was not in company with any other bird. As this species is not frequently met with on this coast it may be worth while to notice this instance of its occurrence.—*M. S. C. Rickards; Clifton, February* 25, 1869.

White Woodcock.—A buff-coloured woodcock, shot by Mr. Robert B. Templer, in Galway, is mentioned in your March number (S. S. 1602). I have an old oil-painting of a woodcock as nearly *pure white* as possible: the artist has depicted two sides of the bird, and there is hardly a coloured feather upon it. The picture bears the following inscription:—"This very remarkable woodcock was shot by the Earl of Gainsbro', Nov. 7, 1748, and painted from the bird itself, by S. Goodwin, of Oakham." From the handsome frame assigned to the production, and the trouble taken to give a double representation, this appears to have been thought a very great wonder at that time of day.—*Geo. Dawson Rowley; 5, Peel Terrace, Brighton, March* 3, 1869.

The Skins of Alca impennis.—I have read in the 'Zoologist' for March (S. S. 1603) the letter of Mr. J. H. Gurney, jun., on the four skins of Alca impennis: one of these, that belonging to Mr. Frank, is now on its road to join a female already in my collection; but as I have received the invoice, dated Rotterdam, February 13, and as yet no signs of the bird, I conclude that it has either taken to its natural element again, or else that the Custom-house officers have turned ornithologists. Mr. Gurney speaks of one "in full summer plumage"; would that he could tell us of a specimen "in full *winter* plumage"—he would be a great benefactor to my work 'The Alciana,' I having searched many places in Europe in vain. The downy state would be still more desirable, but this is now lost for ever—one of the good things gone never to return.—*Id.; March* 1, 1869. [See *ante*, p. 1641.]

Bewick's Swan at Flamborough.—I have, in the flesh, a Bewick's swan shot on a pond at Flamborough, by Mr. Johnson Dove. It is pure white, except that the forehead is marked with rust-colour. I believe that the merit of the first discovery of this species was actually due to my friend Mr. Hancock, although Richard Rutledge Wingate "tulit honores" (of Selby's 'British Ornithology,' ii. 284).—*J. H. Gurney, jun.; The Bank, Darlington, February* 26, 1869.

Kittiwake Gulls on the Thames.—Cooper, the birdstuffer, of Radnor Street, St. Luke's, showed me to-day a kittiwake gull, which had been shot with another, about the middle of last month, on Chertsey Common. The bird was in the change from winter to summer plumage: the bluish gray markings behind the eyes had not entirely disappeared, although the head was nearly white. He had received a specimen shot at Putney, and also one from Datchet, shot by Reeve, the fisherman (this bird was in immature plumage). Is it not remarkable that so many specimens of the kittiwake, a purely ocean-feeding gull, should have strayed so far inland as they appear to have done this year?—*A. H. Smee ; March* 12, 1869.

PROCEEDINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY.

March 1, 1869.—H. W. BATES, Esq., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—'Proceedings of the Royal Society,' No. 108; presented by the Society. 'Bullettino della Società Entomologica Italiana,' Anno primo, Fascicoli I.; by the Society. 'Coleopterologische Hefte,' Part iv.; by the Editor, Baron E. von Harold. 'Bidrag til Kundskab om Christianiafjordens Fauna,' af Dr. Michael Sars; by the Author. 'The Zoologist,' for March; by the Editor. 'The Entomologist's Monthly Magazine,' for March; by the Editors.

Election of Member.

Charles Horne, Esq., of 3, Bernard Villas, Upper Norwood, was ballotted for, and elected a Member.

Exhibitions, &c.

Mr. Bond exhibited specimens of Heliothis armiger from the Isle of Wight, Java and Australia. The insect had been taken in Java by Dr. Horsfield; the Australian specimens were captured by Dr. Madden.

Mr. W. C. Boyd exhibited dwarfs of Vanessa Urticæ, Smerinthus Populi, Saturnia Carpini and Pygæra Bucephala, all bred in 1868, by Mr. Davis, of Waltham Cross, and scarcely more than half the ordinary size of the species: this was attributed to rapidity of development, owing to the heat of the summer.

Dr. Wallace exhibited a number of Bombyx Yamamai and their cocoons: during last season he bred about fifty of them at Colchester, and found them to vary considerably in colour: the moth was in the habit of performing summersaults and manœuvres, like those of Cilix or Limacodes when netted. Also Bombyx Pernyi, another oak-feeding species from China, of which he had received through the Foreign Office a number of cocoons, from which the moths were hatching, and one had laid about 270 eggs: he hoped to make some useful experiments with this species, which like Bombyx Cynthia was double-brooded, but would probably be found to require a dry climate and warm soil. Also English-bred specimens of the American Saturnia Cecropia. Dr. Wallace made some remarks on the progress of sericiculture in this country and the colonies: what was principally required was an experiment on a large scale to test the commercial value of the product: with this view a gentleman in Paris desired to purchase 500 ℔s. of cocoons, for which he was willing to give 25*d*. per ℔.

Dr. Wallace also exhibited a moth which, on the 18th of January, 1869, he observed on the window of his room; but, under the impression that it was a small female of the common Emperor moth, left it undisturbed. On the 19th he noticed that the antennæ were pectinate, and thinking it still to be a female Saturnia Carpini with the antennæ of a male, he killed it and set it out. Closer examination showed that it was not an Emperor moth at all, and he at length bethought him of a parcel of cocoons, which he had received in 1867 from Dr. Hooker, of a Chinese Bombyx which was said to yield the "gut" of fishermen. (See Proc. Ent. Soc. 1867, p. civ.). On looking at the cocoons, none of which were productive during 1868, it was found one of them had hatched, and there was unmistakable evidence of the recent emergence of a moth from the pupa: he had no doubt the moth exhibited was the produce of that pupa. Mr. F. Moore recognized the species as Saturnia Pyretorum (Westw. Cab. Orient. Ent. p. 49, pl. 24, fig. 2).

Dr. Wallace mentioned that he had availed himself of the sample or pattern post for the transmission of boxes of silk-worms or their eggs: so long as there was an aperture at each end of the box, which apertures might be covered with perforated zinc or other material, but left it ascertainable that there was no letter enclosed, no objection was raised by the Post-Office authorities; and he had lately sent a box by post to Japan for eggs at a cost of 4*s*., which when it last came thence as a parcel had cost 47*s*. Mr. Horne added that bird-skins were now frequently sent from India by sample post.

Mr. M'Lachlan exhibited three male specimens of Dilar Hornei (Ent. Mo. Mag. v. 239), a new species from India of a genus remarkable amongst the Neuroptera for the possession of pectinate antennæ.

Mr. Horne, by whom the species was brought to this country, said the insect was not uncommon in North-West India, on the hill sides, amongst grass in damp places, but not near water: the female had a long yellow-brown ovipositor shaped like a scimitar, which, so far from looking flexible, had the appearance of being very stiff.

Mr. Horne exhibited sheets of the inner portion of the bark of Pinus longifolia, which he had found useful in India as a substitute for cork: it was tolerably soft, and the resin was not injurious to insects.

Prof. Westwood mentioned that in the previous month he had seen exhibited at Oxford a full-grown larva of Lampyris noctiluca, which was distinctly luminous.

Mr. J. J. Weir exhibited a mass of larvæ of Tipula from Blackheath, where acres of land were so infested that there seemed to be more larvæ than earth. In Greenwich Park the grass was, at this early period, almost destroyed by them. Rooks, starlings and sparrows appeared to be busy in the neighbourhood, but no diminution in the number of the grubs was observable.

Mr. Bond mentioned that he had once known four hundred of these larvæ taken out of the crop of a pheasant.

Papers read.

Mr. Charles O. Waterhouse read a paper "On a new Genus and some new Species of Coleoptera belonging to the Family Lucanidæ."

Mr. J. Jenner Weir read a paper "On Insects and Insectivorous Birds, and particularly on the Relation between the Colour and the Edibility of the Larvæ of Lepidoptera."

Mr. A. G. Butler read a paper "On some Caterpillars which are unpalatable to their Enemies."

Mr. Weir's experiments were suggested by the remarks of Mr. Alfred R. Wallace, reported in Proc. Ent. Soc. 1867, p. lxxx.: the conclusions at which he arrived were, that, as a rule, hairy and spinous larvæ were rejected by birds (unless the cuckoo were an exception); but he doubted whether the mechanical difficulty of swallowing them was the cause of their rejection, and rather thought that the hairs were the concomitant of a disagreeable quality of which they acted as an indicator; that bright and gaily-coloured larvæ were, as a rule, refused; but that smooth larvæ of a greenish or dull brown colour, such as are for the most part nocturnal in their habits, and those which simulate the leaves or twigs of trees upon which they live, were eaten with avidity.

Mr. Butler's observations were on the consumption or rejection of larvæ by lizards, frogs and spiders; both lizards and frogs would eat hairy larvæ; and even the stings of bees had no deterrent effect upon a lizard.

These two papers led to a prolonged conversation, in which the President, Mr. Horne, Mr. A. R. Wallace, Mr. Butler, Mr. M‘Lachlan and Dr. Wallace, took part.

Mr. Horne said that in India lizards were almost omnivorous, and ate bees with avidity; a friend of his, Colonel Ramsay, had hives of Aphis dorsata placed near some stone walls or terraces, which were a favourite resort of lizards; they would come to the mouths of the hives, lie in wait for the bees, and take them, sting and all. Larvæ of all sorts, smooth or hairy, dull or bright, were eaten by lizards; but scorpions were rejected; bears, however, would eat scorpions, and he had seen bears turn over stones in search of scorpions, and eat them regardless of their stings. He had noticed that a common Indian species of Carabus, and all the blister-beetles, seemed to be free from attacks of any animal.

Dr. Wallace said that the larvæ of Bombyx Cynthia, which were both gaily coloured and covered with tubercles, were eaten by cuckoos, robins and tomtits: the two latter made holes in the skin and took out the inside, whilst the cuckoos swallowed the larvæ whole.

Mr. Alfred R. Wallace was pleased to find that the observations of Mr. Weir went so far to support the theory which, reasoning entirely from the analogy of what had been observed in the Heliconiidæ, he had ventured to suggest in answer to a question of Mr. Darwin's. He thought there was now a solid foundation of fact for the hypothesis that the bright colour of larvæ was protective, and was (as it were) a flag hung out to warn off their enemies. Doubtless every detail either of form or colour had its object and bearing upon the history of the creature. It was not necessary that the law should be absolute or the rule universal; he did not expect to find, on the contrary he should have been surprised if it had been found, that *all* brightly coloured larvæ were peculiarly protected, or that the bright colour of any particular larva protected it from *all* enemies; if it thereby obtained protection from a single enemy, if it was left exposed to the attack of but one enemy less than its neighbours, to that extent at least the colour gave it an advantage; the theory of protective warning supplied the reason for, and afforded a rational explanation of, the gay colouring, which in the case of larvæ could not be accounted for by sexual selection.—*J. W. D.*

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Notes on the Zoology of Newfoundland, *Henry Reeks, F.L.S., F.Z.S.*, 1609.
Life-Histories of Sawflies (translated from the Dutch of M. S. C. Snellen van Vollenhoven), *J. W. May*, 1614.
Collected Observations on British Reptiles, *Edward Newman*, 1617.
Rough Notes from the Channel Islands, *John A. Harvie Brown*, 1630.
Preservation of Sea Fowl, 1632.
Notes on the Great Auk, *J. H. Gurney, jun.*, 1639.

BIRDS.—Slaughter of Sea-fowl at Weston-super-Mare, *Rev. M. A. Mathew, M.A.*, 1644. American Robin, *C. R. Bree, M.D.*, 1644. Pugnacity of the Wren, *James Murton*, 1644. Purple Sandpiper at Weston-super-Mare, *M. S. C. Rickards*, 1645. White Woodcock; The Skins of Alca impennis, *Geo. Dawson Rowley, M.A.* 1645. Bewick's Swan at Flamborough, *J. H. Gurney, jun.*, 1645. Kittiwake Gulls on the Thames, *A. H. Smee*, 1645.

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CHANGE OF RESIDENCE.—I am requested to state that Mr. Samuel Stevens has removed from 6, Holland Place, Brixton, to 28, King Street, Covent Garden.—*E. N.*

To Tourists and Collectors.

J. H. DUNN, (Son of the late ROBT. DUNN, Author of the 'Ornithologist's Guide to Orkney and Shetland), Naturalist, Stromness, Orkney, begs to inform the public that he has constantly on sale, at moderate prices, properly prepared SKINS AND EGGS OF ORKNEY AND SHETLAND BIRDS; also a great variety of other rare British Eggs, many of which are of his own collecting. Price Lists three Stamps.

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